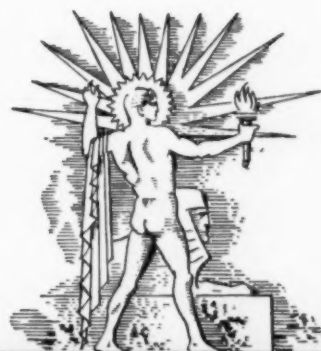


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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



January 20, 1940

What the Fish Sees

See Page 40

A SCIENCE SERVICE PUBLICATION

## Do You Know?

Home economists say that ironing causes less fatigue if the worker stands on a thick rug or a rubber mat.

Longhorn cattle of western plains were surly, easily frightened; hence the cowboy songs sung to quiet a milling herd.

German chemists are reported able to make synthetic wool out of potato leaves, thereby opening up a large new source of textiles.

One motor fuel manufacturer has a new testing laboratory which can produce such weather effects as heat waves, cold waves, and windstorms.

When poison ivy grows in apple orchards there are apt to be more leaf-hopper pests, because the hoppers find the poison ivy a congenial host plant.

Seventy-eight degrees below zero was registered on an alcohol minimum thermometer at Little America one cold day in July, 1934, during the second Byrd Antarctic expedition.

Impressed by the new sulfanilamide treatment of the eye disease trachoma, developed by doctors in the U. S. Indian Service, a Siamese physician is studying the method.

With modern baking methods, whole wheat bread has about five times the vitamin B<sub>1</sub> found in ordinary white bread; but methods of restoring this vitamin loss in white bread are being evolved.

## SCIENCE NEWS LETTER

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## QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

### Aeronautics

What kind of laboratory is urged by the N.A.C.A.? p. 44.

### Archaeology

Why was the art of Egyptians so queer? p. 36.

### Botany

How do wilt resistant plants remain free of disease? p. 41.

### Chemistry

Who was awarded the Perkin Medal? p. 46.

### Engineering

How do pumps operate in guiding a boat? p. 44.

### General Science

Who invented the first submarine? p. 41.

Will civilization fall before the onslaught of war? p. 42.

### Geology

How are submarine canyons caused? p. 45.

What new mineral deposit has been found in Wyoming? p. 40.

### Ichthyology—Psychology

What does a fisherman look like to a fish? p. 40.

### Mathematics

What confirmation has been made of the evidence that periodic changes in solar activity affect the earth's weather? p. 39.

### Medicine

How can soldiers be protected against the disease carried by cooties? p. 35.

What chemicals are preventing mastoid troubles? p. 40.

What new treatment has been successful against severe burns? p. 38.

What new weapon has cut down the deaths from influenzal meningitis? p. 35.

What purpose is served by a "splint bank"? p. 37.

### Medicine—Chemistry

What revolutionary discovery affects the search for knowledge of cancer? p. 36.

### Military Science

For what purpose are German pilots using incendiary bullets? p. 40.

### Physiology—Statistics

In what way can statistics aid in forecasting death? p. 38.

### Psychiatry

What medicinal value has a shock electric current through the head? p. 35.

### Psychology

What are some of the love problems of adolescents? p. 40.

### Public Health

What engineering problem affects the incidence of infantile paralysis? p. 37.

The United States produced 859,000 barrels of aviation gasoline in October; and could produce 1,500,000 barrels a month if necessary, it is estimated.

"The continued presence of smallpox in epidemic form in the United States is a national disgrace," declares Surgeon General Thomas Parran of the U. S. Public Health Service, pointing out that, despite vaccination being cheap and safe, there were 14,763 cases of smallpox in the United States in 1938.

An alligator snapping turtle has lived in the Philadelphia Zoo for 50 years, and it was an adult when it arrived.

Germany's war economy includes restriction on boron compounds, which figure in making leather, cosmetics, glue, shellac, and paper.

Orange juice not only provides calcium, but enables the body to store greater amounts of calcium from other foods, experiments indicate.

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## MEDICINE

# Vaccine Protects Soldiers Against Cootie-Borne Typhus

Harvard Research Valuable in Fighting Wars;  
Can Be Made Rapidly on Large Scale When Needed

**P**RACTICAL large-scale production of a vaccine that will protect against typhus fever of the European type, lice-borne disease that menaces armies, is the accomplishment of a research group at Harvard Medical School headed by Dr. Hans Zinsser, author of "Rats, Lice and History."

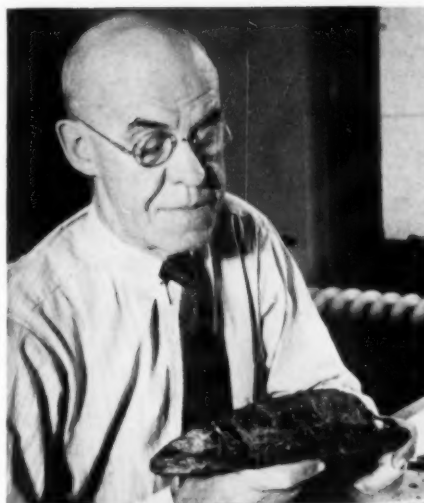
Since cooties and the ill they spread may kill or disable more soldiers than bullets, the typhus vaccine is probably more important than the invention of a new anti-aircraft gun or a new kind of pill-box defense. No immunization against typhus was available during the World War. Dr. Zinsser first demonstrated the possibility in 1930.

One bacteriologist and two technicians in a week can produce over a quart of the vaccine sufficient for 300 complete immunizations. Production can be expanded by increasing equipment and personnel, whenever the need arises.

Little embryo chicks in partially hatched eggs and a germ food made from seaweeds, agar, are used for growing the Rickettsiae, the germs that cause typhus fever, which are used in making the vaccine.

In Dr. Zinsser's team working on this problem are Dr. John F. Enders and Dr. Harry Plotz, a guest worker from the Pasteur Institute, Paris.

*Science News Letter, January 20, 1940*



## UNUSUAL

*Eighty million years old, looking a good deal like a herring, this well-preserved fossil fish, here being inspected by Charles W. Gilmore of the U. S. National Museum, was found near Oacoma, S. D., by a rancher. The fish still retains its original shape quite perfectly. Most fossil fish are crushed by the rock layers in which they are found buried.*

## PSYCHIATRY

# Electricity Through Head Is New Shock Treatment

Treatment Developed in Rome Is Easier on Patients  
Than Metrazol or Insulin; Said To Be Without Danger

**U**SE of electric shock treatment for mentally sick patients is announced to the medical world by Dr. Lothar Kalinowsky, of Rome, through a report to the medical journal, *Lancet*, (Dec. 9)

The treatment is like the now widely-used insulin and metrazol shock treatments. Instead of injecting either of these shock-inducing drugs, an electric current is passed through the patient's head to induce the fits, or convulsions, which restore the patient to sanity, for a time at least.

The electric shock treatment is said to be much easier on the patient, and also on the nurses and attendants, than the metrazol or cardiazol shock treatments. Nor is there any danger from the amount of current used to induce the fits.

"Several thousand fits have been produced on some hundred patients, partly treated in the Rome clinic and partly reported from other institutions, without

any accident whatever," Dr. Kalinowsky states in his report of the electric convulsion method.

The number of patients treated is still too small and the time since treatment is too short to allow definite conclusions as to the curative value of this method, he says.

"According to information given by several institutions it can only be said," Dr. Kalinowsky reports, "that the number of recovered and improved cases of schizophrenia corresponds at least to that of the remissions of cases which, in the same clinics, were treated with cardiazol (metrazol)."

All the disagreeable sensations patients complain of with metrazol treatment are said to be missing with the electric shock method. The patient always loses consciousness and awakens slowly, with no memory of the experience. No fractures, dislocations or ruptured muscles have ever been seen,

though Dr. Kalinowsky admits that they could occur.

Electrodes are put on both sides of the patient's forehead, animal studies having shown that the temples are the best place for the treatment. Currents of 70 to 110 volts and 300 to 600 milliamperes are generally needed to produce fits. The shock is given for one-tenth of a second.

*Science News Letter, January 20, 1940*

## MEDICINE

# Find New Weapon Against Influenzal Meningitis

**A** POWERFUL serum for fighting dangerous influenzal meningitis is in prospect as a result of studies by Drs. Hattie E. Alexander and Michael B. Heidelberger of the College of Physicians and Surgeons, Columbia University, and Presbyterian Hospital in New York City. (*Journal of Experimental Medicine*, Jan. 1)

Influenzal meningitis is not due to the virus that causes influenza, but to another kind of germ, called *Haemophilus influenzae*, type B. The disease attacks small children chiefly. It is rare in adults or even in children over eight years old. It is highly fatal. The mortality rate was 99%, but within recent years use



of an anti-serum has reduced this to 75%, according to reports from some institutions.

Using rabbits instead of horses to make the anti-serum, and employing other advances in serum-making technic, Drs. Alexander and Heidelberger have prepared an anti-serum which increases from five to 10 times the antibody content, or disease germ fighting substances, in rabbits' blood.

Use of the new, powerful anti-serum in human cases has not yet been reported. The potency of the material has been measured in terms of antibodies, disease germ fighting substances, found in rabbits' blood, after injection of the new serum. The value of the new anti-serum for treating desperately sick babies remains to be determined.

*Science News Letter, January 20, 1940*

#### ARCHAEOLOGY

### Egyptians' Art Queer? Ours Would Be to Them

**D**ON'T look down on ancient Egyptians because they painted such flat, queer-looking pictures with no good modern perspective. They had their reasons.

The Egyptian artist aimed to explain a situation, says Dr. Dows Dunham, noted Egyptologist of the Museum of Fine Arts, Boston.

Like a modern architect drawing house plans, the Egyptian meant to get every essential detail into his drawing. Hence the stiff diagram look of Egyptian art.

The Egyptian went farther. He showed that a king was important, and his children and servants less so, by making the king a big figure and those around him small. He devised ways of drawing clothing which would enable him to show curves of the body, yet make it clear that the body was really hidden by garments. Hobble skirts worn by women in Egyptian paintings do not mean that hobble skirts were the fashion. Nor did Egypt's women wear only half a waist in their dresses, as painters' technique might lead you to wonder.

Good reason for this drawing style: Tomb paintings had a religious value, providing symbols which would enable the dead to reconstruct for use original objects used during life. A pictured door with no handle could not be opened, Egyptians reasoned.

It would bewilder an Egyptian to see a modern painting of a garden—just top halves of trees over a wall, leaving out the fish pond and flowers on the other side!

*Science News Letter, January 20, 1940*

#### MEDICINE—CHEMISTRY

## Discovery Refutes Report Of Difference in Cancer Cells

### Revolutionary Finding Reveals That Both Right-Handed And Left-Handed Amino Acids Occur in Healthy Tissues

**T**HE OLD idea that only "right-handed" amino acids occur in the living, healthy body, and the new idea that "left-handed" forms of these chemicals are indicators of cancer, have been refuted in the latest of Uncle Sam's researches upon disease.

This revolutionary chemical discovery has just been made by Dr. J. M. Johnson, biochemist at the National Cancer Institute, and by Dr. Dean Burk, of the National Cancer Institute, in collaboration with Drs. Fritz Lipmann, Otto K. Behrens and Elvin A. Kabat at Cornell University Medical College, New York City.

The discovery refutes the widely hailed finding of a fundamental chemical difference between cancer and normal tissue. This finding was first announced by Prof. F. Kögl and Dr. H. Erxleben, of the University of Utrecht, and other scientists have since reported finding the same difference.

The difference was believed to lie mainly in the kind of glutamic acid existing in cancer tissue. Glutamic acid is one of the amino acids which are building blocks for tissue protein in the body. In cancer tissue, glutamic acid occurred in a so-called left-handed form, Drs. Kögl and Erxleben reported. This means that it could turn a beam of polarized light to the left.

Chemists ever since the time of Emil Fischer, the great German scientist who at the close of the last century discovered amino acids like glutamic acid, have taken it for granted that the glutamic acid occurring in nature was a right-handed acid, turning the beam of polarized light to the right, although the unnatural forms of other amino acids had been prepared in the laboratory. So the discovery by Drs. Kögl and Erxleben was hailed as opening the way to a chemical attack on the great killer, cancer.

Using the method of Drs. Kögl and Erxleben, Dr. Johnson extracted glutamic acid crystals from a rat cancer, from the same rat's liver, and from the liver of a healthy animal that had no cancer. He examined the crystals and, unlike Drs. Kögl and Erxleben, found the natural

form in the first crop of crystals from both cancer tissue and normal tissue.

"Go back and examine the mother liquor," his chief, Prof. Carl Voegtlin, director of the National Cancer Institute, told him.

The mother liquor is the material that was left after glutamic acid had crystallized out. A little glutamic acid was apparently still present in this liquor, however. Dr. Johnson discovered in this mother liquor, from both normal and cancer tissues, not only the natural glutamic acid, but the unnatural form of it.

Dr. Burk and associates, working in the biochemical laboratory of Prof. Vincent du Vigneaud at Cornell, used another method for observing unnatural amino acids in cancer and in normal tissue. They used an enzyme which is specific for and only acts on the unnatural, left-handed forms of amino acids. When this enzyme is added to digested cancer or normal cells in the test tube, any unnatural amino acids present are changed by the oxygen of the air into other chemicals, but the natural forms are not touched. Analyses showed that in all cancer and normal tissues examined there were the same small amounts of unnatural amino acids attacked by the enzyme.

Discovery that glutamic acid and other amino acids exist partly in their unnatural form opens the way for new lines of chemical research, although it shows that malignancy, or cancer, is not characterized by the presence of amino acids of unnatural form.

*Science News Letter, January 20, 1940*

## ● RADIO

Dr. Sidney D. Kramer, executive secretary of the General Advisory Committee of the National Foundation for Infantile Paralysis, will discuss the possibilities of eventual discovery of the cause and prevention of this disease as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, January 25, 4:15 p.m., EST, 3:15 CST, 2:15 MST, 1:15 PST.

Listen in on your local station. Listen in each Thursday.



#### RECORD-BREAKING KISS

A Greek kiss held for 2,400 years is revealed in this terra-cotta plaque unearthed in the ruins of Olynthos. Dr. David M. Robinson of the Johns Hopkins University, director of the excavations, pronounces it the oldest known kiss in Greek sculpture. The affectionate figures were an ornament in a house and were buried when Philip of Macedon, father of Alexander the Great, demolished the attractive city in 348 B. C.

#### PUBLIC HEALTH

## Paralysis Epidemics Linked With Sewage Disposal Method

Statistical Study Reveals That High Rates Of Infantile Paralysis Occur With Inadequate System

INFANTILE paralysis epidemics and a recent trend in sewage disposal methods, especially in small towns, are linked in research announced by Drs. Albert E. Casey and Branch J. Aymond, Louisiana State University School of Medicine and Louisiana State Board of Health. (*Science*, Jan. 5)

Occurrence of infantile paralysis epidemics in the past few decades, they state specifically, "may have been influenced by the growing tendency of communities to liquefy their excreta without making adequate provision for the disposal of the accumulated fluids."

Infantile paralysis, they found from studying state health department reports for the 10 years 1929-1939, occurred at about the same rate in the only two large cities of Louisiana, in the rural areas and in the towns with populations between 5,000 and 49,999. The rates in these communities were about 30 cases per 100,000

population. In incorporated communities of 100 to 2,999 population, however, the rates were three times those in rural communities and larger towns.

Neither age, sex nor race factors explained the differences in infantile paralysis rates between these different communities. The only factor which could be statistically correlated with the preponderance of infantile paralysis in the small towns was the presence of a water supply system and the absence of an adequate sewage disposal system.

The highest rates of infantile paralysis, 120 cases per 100,000 inhabitants, were found in those towns with water supply but no sewerage system, in which the average daily water supply was from 50 to 89 gallons per capita. Towns without sewerage systems in which the average daily per capita water supply was from 90 to 500 gallons had infantile paralysis rates about the same as the rural and

large town communities. This suggests, Drs. Casey and Aymond state, that large amounts of fluid act as a dilution factor or as a factor increasing the rate of flow.

*Science News Letter*, January 20, 1940

#### MEDICINE

## "Splint Bank" Prevents Crippling from Paralysis

A "SPLINT BANK" which promises to reduce the number of permanent cripples among future victims of infantile paralysis has been established by the National Foundation for Infantile Paralysis.

How the staff of this new kind of bank, themselves victims of infantile paralysis, worked three shifts a day and Sundays to handle a "run" on the bank during the Buffalo infantile paralysis epidemic last summer was told by Dr. George E. Bennett, Johns Hopkins University School of Medicine, at a dinner given by the National Foundation in honor of Mrs. Franklin D. Roosevelt and the women leaders in the 1940 Fight Infantile Paralysis Campaign.

Splints that hold the muscles immovable in a neutral position prevent deformities from contracture or overstretching of any of the muscles involved in infantile paralysis, Dr. Bennett explained. The splints also make the patient more comfortable and hasten recovery of paralyzed muscles. Best results are obtained when they are applied early, but when an epidemic of the disease strikes a community, not enough splints may be available to take care of all the patients.

Such a situation, occurring in Ontario, Canada, three years ago, led to the founding of the splint bank. During this Canadian epidemic the staff of the Hospital for Sick Children of Toronto developed a type of splint "as near ideal as could be produced and yet simple." The splints are so standardized that the doctor needs only to measure his patient and splints of the proper size can be supplied from stock.

A stock of such splints, made with funds supplied by the National Foundation for Infantile Paralysis, has been deposited in the "splint bank," located in the brace shop of the Maryland League for Crippled Children at Baltimore. The bank had 250 splints on hand when the epidemic broke in Buffalo. But this number was insufficient to supply the needs of infantile paralysis victims in that city. So, working three shifts a day and Sundays, for a month and a half, recovered infantile paralysis patients made enough

more so that a total of 750 splints could be sent out, 547 to Buffalo and the rest elsewhere.

Branch splint banks throughout the United States are now planned, and it

is hoped, Dr. Bennett said, "that before 1940 passes no child or adult stricken with infantile paralysis need wait for proper early splinting."

*Science News Letter, January 20, 1940*

#### PHYSIOLOGY—STATISTICS

## Q and R Factors in Equations Betray Coming of Death

**Gray Hair and Wrinkled Skin Not So Satisfactory As Warnings as Are These Statistical Clues**

**G**RAY HAIR and wrinkled skin are not as satisfactory signs of old age and approaching death as Q and R. These letters are symbols of new equations devised by Dr. Henry S. Simms, College of Physicians and Surgeons, Columbia University, for shedding light on the aging processes. (*Science*, Jan. 5)

We do not grow old as a result of a random accumulation of degenerative changes, Dr. Simms' equations show, thus upsetting the present theory of the aging process.

"It is perhaps correct to say that there is an accumulation of degenerative changes," Dr. Simms states, "but that the process follows a definite mechanism such that the rate of change at any age depends upon the amount of accumulated change. Why this mechanism should be followed remains to be determined."

Q and R are functions which control the death rate after the age of 30 years. Q changes with age. There are indica-

tions, Dr. Simms states, that the change in Q affects mortality by increasing the death rate when disease is present, rather than by increasing the tendency to become diseased.

Changes in R may account for the faster increase in death probability of diseases of the blood vessels (heart and artery diseases) over the increase in death probability of certain infectious, digestive and nervous diseases. The nature of this R function is unknown, but Dr. Simms suggests that it may be some property of the blood vessel system such as arterial distensibility or capillary permeability.

A statistical correlation between senile debility and senile death rate has been found by Dr. Simms' mathematical studies. This suggests, he says, that the progressive debility in old age is caused by the same Q and R functions which control the death rate.

*Science News Letter, January 20, 1940*

ment. Heretofore physicians have tried to fight shock, first cause of death in extensive burns, by giving all the fluids the patient will take and urging him to take even more. This treatment, the Indianapolis physicians declare, may cause water intoxication severe enough to kill the patient.

An experience with this standard treatment in which the patient, a two-year-old baby girl, died led them to their new theory on burn treatment. Post-mortem examination of the child's body showed "a tremendous waterlogging of all tissues." Changes in the child's blood, including a striking deficiency of salt, also suggested that large quantities of fluid were harmful in treating burn shock.

The Indianapolis physicians were in the midst of animal studies of their new theory of burn shock treatment when a 15-year-old girl was brought to the hospital an hour after she had been badly burned when her evening dress caught fire from a lighted match thrown on the ballroom floor. Daringly, the physicians used the new system of treatment.

#### Morphine

Morphine, to relieve pain, removal of the charred remnants of her dress, and a one and one-half hour bath with salt water and green soap came first. About one pint of salt water with sugar was injected, and her drinking water, orange juice and the like were limited to about one quart a day. Meanwhile blood donors had been found and typed and eight hours after arrival at the hospital she was given the first transfusion of about one pint of blood with about one pint of salt water.

The young patient had a stormy illness. Her temperature was persistently high, and any manipulation caused chilling. She had altogether six large blood transfusions within four days, two of them consisting of blood plasma alone because tests showed an excess number of red cells in her blood. Because of her grave condition, the fifth transfusion was given "with considerable apprehension," the doctors report, and the sixth was given 24 hours later in spite of the fact that symptoms of reaction after the fifth one were growing worse. This was followed by a chill and rapid rise in temperature, and at this time the patient was not expected to live. She was placed in an oxygen tent and her condition slowly improved. Within one month she was able to go home and within two months her burns were completely healed and she was entirely well.

#### MEDICINE

## Dramatic Success Reported With New Treatment of Burns

**Transfusions of Large Amounts of Blood and Reduction In Amount of Fluids Given Patients Are Chief Points**

**T**HE DRAMATIC recovery of a young girl from severe burns following the first trial of a new transfusion treatment daringly given in the face of impending death is reported by Drs. H. M. Trusler, H. L. Egbert and H. S. Williams, of Indianapolis. (*Journal, American Medical Association*, Dec. 16)

Even though the girl was so gravely ill by the fourth day of treatment that

"all who saw her were convinced she would die," the physicians did not lose faith in their new system of treating severe burns. Their courageous persistence was rewarded by their pretty young patient's complete recovery.

Transfusions of large amounts of blood and reduction in the amount of water and other fluids given the patient are the chief points of the new burn treat-



"We believe that a state of irreversible shock was prevented," Dr. Trusler and associates state, "and that her life was saved by the repeated intravenous administration of properly balanced fluids, the most important components of which were blood and blood plasma."

They also stress the value of oxygen and describe the treatment of the burned area. In this connection, however, they declare that "no local application can be expected to save life after a large burn."

*Science News Letter, January 20, 1940*

great influence in changing the prevailing scientific opinion."

*Science News Letter, January 20, 1940*

#### ENGINEERING

### Highway Jacked Apart To Make Divided Roadway

HOW a four-lane highway was "jacked" apart to make a divided roadway and thus reduced fatal accidents over 83%, was described at the meeting of the Highway Research Board of the National Research Council in Washington by Arnold H. Vey, traffic engineer of the State of New Jersey.

New Jersey took a popular four-lane highway and split it down the middle, jacking up separate concrete slabs and moving them sideways. Two roadways, separated by a dividing center strip, thus resulted.

A study of accident figures on this road in 1933-34, before the division, and for 1937-38, after the division, showed that fatal accidents dropped 83.3%. Non-fatal accidents decreased 48.5% and accidents involving property damage were cut 17.6%. The reduction for accidents of all kinds was 40.4%.

Particularly valuable was the new divided highway at night, for accidents were then decreased by 47.2% while during the day they dropped only 31.4%.

The cost for the unique jacking and moving job was \$50,000 per mile, Mr. Vey reported. By applying National Safety Council figures to the reduction in accidents, it was found that the saving in accident costs are sufficient to pay for the conversion in slightly over three years.

*Science News Letter, January 20, 1940*

#### MATHEMATICS

## Mathematical Study Confirms Theory of Solar Radiation

### Statistical Work of Dr. Abbot, Evidence of Periods Of Solar Activity, Is Now Confirmed at Harvard

POSSIBILITY of statistical error in the theory that there are significant periodic changes in the sun's radiation which predictably affect the earth's weather has been eliminated by a Harvard mathematician.

The findings, made by Dr. Theodore E. Sterne, Harvard lecturer on astrophysics, are believed to eliminate one of the major objections raised against the solar radiation-weather tie-up recently advanced by Dr. Charles G. Abbot, secretary of the Smithsonian Institution in Washington.

Dr. Abbot's deductions, based on years of solar radiation observations at stations spotted throughout the world, have been questioned as due to either statistical errors in analyzing the data, or systematic errors of observation. The Harvard research removes this first objection.

In his findings, Dr. Abbot discovered evidence for changes in solar radiation in periods of 7, 8, 9 $\frac{3}{4}$ , 11, 21, 25, 34, 39 $\frac{1}{2}$ , 46 and 68 months. Dr. Sterne believes that three of these periods may be due to statistical error—those of 7 months, 8 months and 34 months.

The other seven periods, Dr. Sterne has found, are not attributable to this and the Harvard mathematician has gone so far as to say that the odds against these seven periods being purely statistical error are about 30,000 to one, or even higher, running in some cases into the millions.

Dr. Sterne emphasized that his studies were concerned purely with the statistics of Dr. Abbot's researches and not at all with the question of observational technique.

The periods in question were worked out by Dr. Abbot during the 15 years

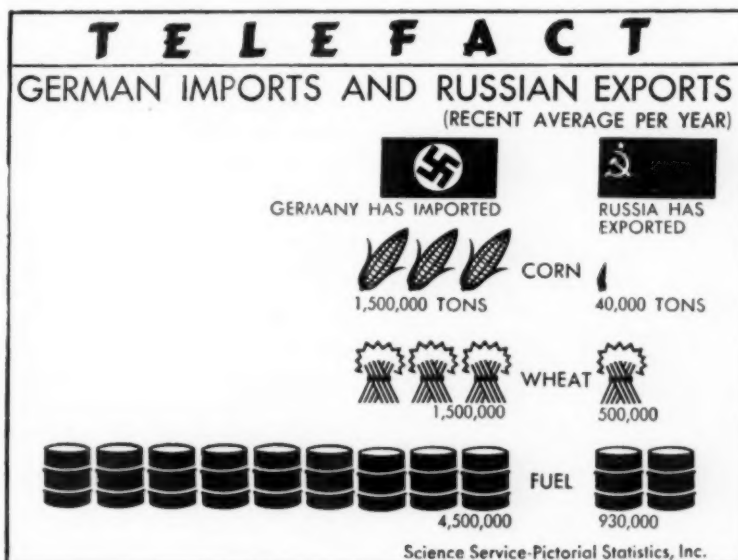
from 1920 to 1934 and are built on the average of solar radiation in many parts of the world three times each month. Dr. Abbot measured the amount of radiation received in calories per minute per square centimeter at right angles to the sun.

The average during this 15-year period, he found, was 1.9410 calories per square centimeter per minute.

Informed of the Harvard announcement regarding statistical studies of his observations on solar radiations, Dr. Abbot said:

"The weight of scientific opinion for many years has been opposed to the variability of the sun or its importance.

"I am convinced, on the contrary, that the variation in the sun is the main cause of weather on the earth and believe that the work of Dr. Sterne, made from a skeptical point of view, will have



## GEOLOGY

**Large Deposit of Trona Is Found in Wyoming**

**A** LARGE bed of trona, important soda-yielding mineral, has been discovered at a depth of about 1600 feet on government land in Sweetwater County, Wyo., it is announced by Dr. W. C. Mendenhall, director of the U. S. Geological Survey. (*Science*, Jan. 5)

The trona layers were found in drill cores of an oil and gas well being put down by a commercial company. In the pure state, trona crystals consist of sodium carbonate, sodium bicarbonate and water. Associated with the trona were small quantities of two exceedingly rare minerals, northupite and pirssonite, which are complex carbonate salts.

Since ample soda mineral beds are already being worked commercially in this country, it is probable that this new deposit will, for the present at least, constitute a reserve rather than an active source of supply.

*Science News Letter, January 20, 1940*

## PSYCHOLOGY

**When to Pet, a Problem Important to Young**

**W**HEN is petting right and when is it wrong? This is the "love problem" which above all others claims the interest of youngsters in their teens, it was found by Dr. Oliver M. Butterfield, who as a student of young people and parent education, has brought together a large number of discussion groups in camps, churches and similar organizations.

The problems of young people are serious, Dr. Butterfield stresses in his new book, *Love Problems of Adolescence* (Emerson). Often they arise not because of the confusion of the young people themselves, but because of the perplexities of parents who are inconsistent or who fail to appreciate changing times.

Such a parent-made problem is one which puzzles particularly boys and girls of 14 or so. How old must a girl be to go out with a boy? One parent may permit dates at 14. A neighbor may insist that her girl wait until she is 20. What is a daughter to think?

Youngsters are anxious to know how to start friendships and sometimes how to keep them from becoming too serious. They want to make a good impression and not be "dropped."

Serious problems are faced by a "ten-

per cent. fringe" who do not fit in with the social groups about them. They are described by the youngsters as bashful, queer, cynical, egotistical, dominating, sophisticated, dreamy, shy, and man-crazy.

Too often, Dr. Butterfield warns, get-together activities are confined to providing a social occasion with no particular attention to the needs of such individual misfits. They, too, need companions.

*Science News Letter, January 20, 1940*

## ICHTHYOLOGY—PSYCHOLOGY

**Museum Visitors See Fish's View of Man**

See Front Cover

**H**AVE you ever wondered how the fisherman looks to that wary fish?

At the pressing of a button, visitors to the American Museum of Natural History in New York are able to see the fish's view. Physical conditions in the stream distort the figure. The man appears with no middle and a head broadened out of all proportion to his rubber-booted legs. The colors are, however, just as we see them, for fish are supposed to have color vision as does man.

The exhibit, shown on the front cover of this week's *SCIENCE NEWS LETTER*, is one of five demonstrating the vision of various animals.

*Science News Letter, January 20, 1940*

## MILITARY SCIENCE

**Pilots Aim Machine Guns By Using Tracer Bullets**

**G**ERMAN fighter pilots may be using tracer bullets instead of the conventional open gun sights as a means of sighting their machine guns.

Royal Air Force pilots report that their adversaries have in their gun magazines between 25% and 100% of the incendiary bullets that leave a trail visible for 300 yards, the range of fighter plane machine guns. This is the first time such a high percentage has been consistently used aloft and can be attributed only with difficulty to the simple desire to set fire to the enemy plane as quickly as possible. Fewer tracers would suffice if the latter were the only purpose in their use.

Tracer bullets are commonly used for spotting a target and aiming at night, but this is believed the first time they have been so used in the air under all conditions. English airmen are critical of the scheme, however, preferring their regular sights.

*Science News Letter, January 20, 1940*

**IN SCIENCE**

## MEDICINE

**Chemical Remedies Useful In Middle Ear Infections**

**T**HE NEW chemical remedies, sulfanilamide and sulfapyridine, are valuable for treating about 40% of the acute middle ear infections likely otherwise to end in mastoid trouble, Drs. L. Dell Henry and Hugh A. Kuhn, of Hammond, Ind., found in their experience with 468 patients, ranging from three months to 63 years of age.

Reporting these results to the American Laryngological, Rhinological and Otolological Society meeting in Columbia, S. C., Dr. Kuhn warned fellow physicians not to use these chemical remedies without first making tests to learn what kind of germs are causing the ear trouble in each case. Nearly half the patients, he and Dr. Henry found from such tests, had ear infections of a type that could not be helped by either sulfanilamide or sulfapyridine. Since the chemicals are not without danger, Dr. Kuhn said, they should not be used indiscriminately.

Out of the whole group of cases studied, 6.6% developed mastoiditis. The necessity of early investigation and treatment of otitis media (middle ear trouble) is shown by the fact that the patients who had early attention with early surgical opening of the ear drum had a risk of two-thirds less than the ones in whom the condition was allowed to go on until the drum ruptured spontaneously.

*Science News Letter, January 20, 1940*

## PSYCHOLOGY

**Complexities of the World Are in Your Own Mind**

**"B**OSS KET", Charles F. Kettering of General Motors who has never been known to write a speech, who expresses disdain for too much formal science and who is an engineer's engineer, is in great demand for his impromptu words of inspiration and wisdom. A recent Ketism:

"Most of the complexities in this world are in our minds. The important thing is not to fail the last time you try to do something."

*Science News Letter, January 20, 1940*



# THE FIELDS

## GENERAL SCIENCE

### Inventors Foresaw Bad Use For Airship and Submarine

**T**HE INVENTOR of the first airship—Francesco Lana, in 1670—conceived the greatest objection to his invention to be the inhuman and unconscionable uses to which it might be put by unscrupulous men.

Leonardo da Vinci, whose notebooks show him to be the inventor of the first submarine, about 1500, explained that he did not publish his method of staying under water "on account of the evil nature of men who would practise assassination at the bottom of the seas, by breaking the ships in their lowest parts and sinking them together with the crews who are in them."

These ancient accounts, pertinent in present war days, are recalled by Prof. M. F. Ashley-Montagu of the Hahnemann Medical College in Philadelphia. (*Science*, Dec. 22)

*Science News Letter*, January 20, 1940

## MEDICINE

### Effective Chemical Cures Expected From New Test

**M**ORE successful use of sulfanilamide and related chemicals in curing germ diseases is promised by a new test reported by Prof. E. K. Marshall, Jr., of the Johns Hopkins University, to the Society of American Bacteriologists meeting in New Haven.

The test, which takes advantage of the feeding habits of mice, provides a much-needed method of evaluating chemical remedies on a quantitative basis. It was worked out by Prof. Marshall and associates.

Sulfanilamide, sulfapyridine, or some other chemical remedy is mixed with the food of the mice. Because these animals eat frequently and at regular intervals, there is always some of the chemical in their systems. A constant concentration of the remedy can thus be maintained in the animal's blood and this gives a basis for determining what blood concentration is necessary to cure streptococcus infection, or which of several remedies

is more effective in amounts that give the same concentration in the blood.

From such studies, Prof. Marshall explained, scientists can learn more exactly which remedy to give patients, how large a dose is effective, and how often the dose needs to be repeated. At present, he pointed out, the value of sulfanilamide and related remedies is somewhat hampered by lack of exact information on these points.

The way in which sulfanilamide acts in the body to check the growth of disease germs and thus "cure" the patient might also be determined from such quantitative comparisons with other similar chemicals. This knowledge might lead to more effective chemical remedies.

*Science News Letter*, January 20, 1940

## BOTANY

### Disease Resistant Plants Make Own Bacteriophages

**B**ACTERIOPHAGES, those mysterious, self-reproducing organic substances that kill and dissolve bacteria, are manufactured by resistant varieties of plants when attacked by germs that cause disease in non-resistant varieties. Roy C. Thomas of the Ohio Experiment Station at Wooster, Ohio, informed the AAAS meeting.

Mr. Thomas worked with the bacteria of corn wilt and corn varieties resistant to this germ. He found that resistant varieties have in their sap a substance which he called a "lysin," which has a powerful killing effect on the bacteria. In the spots or lesions where the bacteria have attacked and been defeated, specific bacteriophages appear, which are able to act only on the particular strain of bacteria that started the infection.

"It was found that a bacteriophage can be manufactured from any strain of the corn wilt bacteria which does not already contain one," Mr. Thomas reported, "and the phage developed for a culture is highly specific for it."

"Several investigators, during the past 50 years have suggested that the mechanism of resistance to disease is similar in plants and animals. A number of workers have detected the presence, in plants, of lysins which could be destroyed by heating at 56 degrees, yet up to the time of this report no one has offered proof that these lytic factors in plants are in any way associated with the bacteriophage and in this capacity serve as a means of active resistance of plants against disease producing organisms."

*Science News Letter*, January 20, 1940

## PHYSIOLOGY

### Blood Supply to Hands Independent of Forearms'

**Y**OU might think that when your hands get cold, for lack of enough blood flowing into them, your forearms would get cold, too, for the same reason. But this is not necessarily the case. Blood flow into hand and forearm is controlled separately for each region, it was shown by researches reported by Dr. Eugene B. Ferris of the University of Cincinnati College of Medicine and Dr. David I. Abramson of the Cincinnati Jewish Hospital.

They found that many stimuli, acting through the central nervous system, will diminish blood flow to the hand but not that to the forearm. They also discovered that stimuli which increase arterial blood pressure often cause a passive increase in blood flow to the forearm but generally cause a decrease in that to the hand.

On the other hand, if you get too warm and there is need for a dissipation of body heat, the blood flow to the hands readily increases, while that to the forearms increases only if the need is great.

*Science News Letter*, January 20, 1940

## CONSERVATION

### Germany Counts Game As War Food Resource

**G**AME birds and animals constitute a rationable food resource no less than more conventional kinds of meat. Commenting on game-food possibilities under war-time conditions, the German weekly, *Die Umschau*, gives, as latest official figures for a year's kill: 3,000,000 hares, 1,800,000 rabbits, 2,000,000 partridges, 1,000,000 pheasants, nearly 750,000 deer of various species.

The journal recommends carefully regulated hunting under State direction, with owners' rights in private preserves suspended for the duration of the war. Game thus taken should be used primarily in military hospitals. Steps in this direction have already been taken, by the wild-life authorities of the Reich.

"Undoubtedly the kill of many game species could be easily increased," states *Die Umschau*.

"This is especially the case with rabbits. The raising of domesticated rabbits should also receive renewed attention. Not only can tasty and easily prepared meat be thus obtained, but a valuable raw material for the German fur industry."

*Science News Letter*, January 20, 1940

GENERAL SCIENCE

# Civilization Won't Smash

## Scientists Believe Civilization Is Able to Survive Despite Setbacks of War That May Be Very Serious

*As war's area spreads, and with it the killing and exile of scientific and intellectual leaders, the destruction of universities, libraries and laboratories, and the suspension of research and investigation in the countries locked in the death-struggle, the question arises again, louder and more insistent than ever: Can civilization survive a world war?*

*Science Service has put that question to a number of America's leading scientists, in widely diverse fields. Their answers are optimistic, although they recognize that war causes serious setbacks to civilization and science.*

### Man Will Think Way Out

By DR. CHARLES F. KETTERING

President, General Motors  
Research Corporation

**I** DON'T believe for one minute that everything we have gained in thousands of years of experience can be wiped out in one disaster. Man has used his ability to think to create the present situation. He has not lost this accomplishment and will, as a matter of course, think himself out.

We are living in a changing world. Right now we are suffering because somewhere in the past changes were not made when they occurred. We have had setbacks in progress in the past and come up stronger than ever. The fundamental forces which bring positive changes are still at work. They will overcome all temporary obstacles in the end.

*Science News Letter, January 20, 1940*

### Spiritual Rebound Likely

By DR. ALES HRDLICKA

Curator of Physical Anthropology,  
U. S. National Museum

**I**F BY "civilization" we mean the cultural status of a people—or of the peoples that will eventually be involved in or affected by the war—then it would be safe to say, I think, that there will be more or less of a loss, and retardation for some time to come. But civilization at large, or even that of the most affected country, cannot be destroyed, nor even largely and permanently affected.

Civilization by now has become the spiritual blood of vast portions of humankind, without which it cannot live. Depression, yes, but not destruction. And when eventually the skies clear again, there may well be expected a spiritual rebound that will compensate for the losses.

Only if the "material-might-is-right" powers should prevail, would conditions become depressed for a long time to come, and civilization during that time would lag; but even then a collapse would be impossible.

*Science News Letter, January 20, 1940*

### War Is Supreme Folly

By DR. ANTON J. CARLSON

Professor of Physiology,  
The University of Chicago

**I**N MY judgment, "civilization" will receive a serious setback but will survive another world war.

In this answer, I assume a world war as extensive and destructive as that of 1914-18. The serious consequences of a so-called world war are not the destruction of property or the destruction or maiming of human beings but rather the brutalizing of the people who are left to carry on when the war is ended.

In other words, the most serious setback to our civilization by war is in the realm of the spirit, our conceptions of liberty, justice, and fair play. But even these will survive and sprout again. So I am not at all pessimistic, despite my conviction that war is a supreme manifestation of human folly.

*Science News Letter, January 20, 1940*

### Role of U. S. Vital

By DR. FRANZ BOAS

Emeritus Professor of Anthropology,  
Columbia University

**T**HE SURVIVAL of civilization after the European war will depend largely upon the energy with which the people of the United States will uphold the principles of freedom of the mind which are the basis of life in our Republic.

Unavoidably war brings with it suppression of freedom of action, and of the free expression of thought, which are recovered with difficulty when peace is secured. Therefore we must not become involved in the war. We must not allow ourselves to become infected by the hatreds based on outworn prejudices that have been rekindled for their own selfish ends by the dictators of Europe.

The most serious task of our country will be to use the full might of its influence to see to it that in the final settlement a basis will be laid for a permanent peace, that no retaliation against any nation shall be permitted, so that victors and vanquished may be able to rebuild what is now being wantonly destroyed by the irresponsible actions of overweening dictators.

*Science News Letter, January 20, 1940*

### Diffusion Insures Survival

By DR. WILLIAM E. RITTER

Emeritus Professor of Zoology,  
University of California  
Honorary President of Science Service

**T**HE complete destruction of "civilization" seems impossible now that it is so advanced over the whole earth and to so large a portion of the human species. Ancient civilizations like the Babylonian, Grecian, and Mayan for example, were so restricted anthropologically and geographically, that their destruction could occur with comparatively little influence from or upon the rest of the world.

But the contributions made by them to the civilization of the species as a whole, and the enormous later contributions by many other peoples and in the same direction, would seem to insure civilization against complete destruction by any agency less than one that would destroy the earth with all life or at least make it uninhabitable by any of the higher kinds of life.

My considerable effort to understand numerous species of animals, the human species with the rest, has given me indications and a strong faith that such experiences as the first and now the second military world war and the intervening economico-political world war may go far toward inducing many persons to join in the desire expressed by E. W. Scripps for more understanding of the kind of animal man is.

Let us start with an epitomized partial answer to Scripps' persistent question. Man, for one thing, is certainly an animal that typically desires the respect, the good will, and the honor of his fellow men; also he desires his own self respect, self good will, and self honor.

An important early step toward such understanding is to recall that many centuries ago one great people, at least (the Greeks), became aware of the importance of men's understanding themselves as shown by their injunction "know thyself"; and that one of them in particular, Aristotle, saw that the carrying out of this injunction leads to the perception that man's similarities to the other animals means that he himself is in very truth an animal (zoön) and is expressly characterizable as a social and a political animal, in the very sense that the honey bee, many birds and quadrupeds are social animals. Then from Aristotle's other utterances that have come down to us the inference is clear that he conceived man as an art and language producing animal, and finally an ethical animal.

In a word, this Greek conceived man as a *civilization producing animal*, civilization including all that we moderns like to attribute to civilization. Then by understanding himself today in the light of the vast knowledge of himself and nature generally our species has accumulated since the Grecian period, we come to understand that our every act of word or deed, of industrial or esthetic art, of science or philosophy, of familial or state government, and of morals or religion—all that goes to the making of civilization—we do by means of those portions of our corporal equipment that makes us superior to any of the other animals.

Hence it is that such understanding makes us aware that our desire to be respected and honored by our fellowmen and by ourselves, is conditioned on our making our acts produced by those parts of our structural equipment in which we are superior to any of the other animals, correspond in very truth with the structural superiority of those parts.

We can have the respect to which we are entitled from our fellow humans, as compared with their respect for other animals, only in so far as our acts are thoroughly human and not more or less *subhuman*. A more penetrating statement of this may be given thus: Any person whose understanding of himself includes the information that he is so endowed by nature as to make him a kind of animal capable of producing civilization, but who nevertheless uses his endowments injuriously to civilization, must be aware

that he thus degrades himself to the level of other animals the actions of which are injurious to civilization.

*Science News Letter, January 20, 1940*

## Social System Will Persist

By DR. CHARLES B. DAVENPORT

Research Associate,  
Carnegie Institution of Washington

**W**HAT is civilization? If it is a condition above that primitiveness found in backwoods people who have no writing, no system of public instruction, and make no or little use of the newest inventions based on the advancement of science, then I think civilization will survive another World War.

If it is the particular system of social organization existing in western Europe and the Americas, sometimes called the capitalist system, then I think that, just as in the last World War that system was for the time being destroyed in Russia, so in consequence of a new World War, the capitalist system may be further replaced by some other, just through the upsurge of the "masses" in consequence of the greater power given to them by the State when it is *in extremis*.

However, in time, though it may be centuries, a social system based on the vast differences in human capacity for playing a part in any social order is bound to arise again, because in the long run biological fact, if ideology is not based on it, will determine the end result.

*Science News Letter, January 20, 1940*

## Need Willingness to Fight

By DR. KNIGHT DUNLAP

Professor of Psychology,  
University of California at Los Angeles

**I**N surveying the problem of war, its causes and consequences, the psychologist employs the historical-comparative method of social psychology. Historical, because social events are as subject to law as are physical events, and only by studying past conditions and results can we understand the present and predict the future. Comparative, because the forms of social organization which have reduced fighting between individuals, between family groups, and between various sub-groups within the nation, are the only forces available for the eventual abolition of war.

In surveying the present problem, the psychologist notes that it is not an abstract question of war *per se*, but a ques-

tion of alternatives (war or else?); that civilization is primarily a matter of ideals and ideas; and that peace is never promoted by refusal to fight for civilized ideals.

Proceeding on these principles, we can safely conclude (from data not capable of brief presentation), that the present war can destroy civilization only if there is lack of force to defend it; or if civilized nations abandon the principle of civilization, adopting the anti-social attitude of selfish fear.

If the Allies win this war, however economically exhausted they may be, civilization is saved. The lessons learned from the neglect to enforce the treaty of



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Versailles when enforcement was possible; from organized propaganda for "pacifism" based on an appeal to cowardice; and from our experiment in "neutrality", which has been, through the ages, the best guarantee of war, will probably not be forgotten. If, however, victory is not made a basis for the application, to international relations, of the principles which have successfully reduced conflict within nations, the work will have to be done over.

Among these principles are: 1. However much we deplore war, war is a duty

when civilized social organization needs to be defended; and saving one's neck at whatever cost is anti-social. 2. That civilized social organization involves cooperation to defend victims of anti-social aggression, whether the victims are persons in the house next door, or other national groups. 3. That anti-social behavior, refusing to uphold justice for others, eventually destroys the nations practicing it. 4. That refusing to fight for principles lest one be hurt is a foolish form of cowardice.

*Science News Letter, January 20, 1940*

to turbulent air flow over a wing was so delayed as to reduce . . . basic air resistance by approximately two-thirds.

"So far the application (of this achievement) is limited to small airplanes, but there are indications of its ultimate applicability to larger airplanes through continued research."

*Science News Letter, January 20, 1940*

#### ENGINEERING

### Latest English Lifeboat Is Propelled by Pumps

**L**IFEBOATS have been needed all too often in recent months thanks to the war at sea. Latest lifeboat news out of England, post war, concerns a new surftype, motor lifeboat propelled by pumps instead of propellers. The pumps used are similar in design to those extensively employed for circulating water in naval vessels and power stations. Two such pumps, one on each side of the boat, are operated by engines. Discharge of the water from the pumps below the waterline propels the boat.

The stream of high velocity water can be directed to any point of the compass by turning a wheel which controls a deflecting nozzle, thus making steering easy. By turning the jets either directly toward or directly away from each other, the boat can be held stationary. By turning both jets outboard, the boat is held against another vessel or wharf without tying up. Striking advantage is that a pump-propelled boat drives through a head sea and over shoals or obstructions in a very remarkable manner.

*Science News Letter, January 20, 1940*

Several television telephone stations have been opened in Germany for "visible" calls in Berlin or from Berlin to Munich, Nuremberg and Leipzig.

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SCIENCE NEWS LETTER

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#### AERONAUTICS

## Engine Research Laboratory Urged by N.A.C.A.

### Committee Calls Move "Of Utmost Importance" for Development of Aviation and for Defense Program

**C**ONSTRUCTION of a national airplane engine research laboratory is urgently recommended in the 25th annual report of the National Advisory Committee for Aeronautics.

Through a sub-committee, whose chairman was Col. Charles A. Lindbergh, it is found "that there is a serious lack of engine research facilities in the United States, and that it is of the utmost importance for the development of aviation in general, and for our defense program in particular, to take immediate steps to remedy this deficiency."

Emphasizing this suggestion, the N.A.C.A., through its new chairman, Dr. Vannevar Bush, president of Carnegie Institution of Washington, continued: "The reason for foreign leadership in certain important types of military aircraft is due in part to the superiority of foreign liquid-cooled engines. At the present time, American facilities for research on aircraft power plants are inadequate and cannot be compared with

the facilities for research in other major fields of aviation."

While the N.A.C.A. did not cite specific examples of foreign planes in the "leadership" class it is believed that Messerschmidt fighters, Heinkel pursuit-fighters and Junkers and Heinkel bombers—all of which are powered with liquid-cooled engines—would be typical planes of the class to which the committee referred.

Aircraft design and research will ultimately replace the Atlantic and Pacific Oceans as the best bulwark for the defense of the United States, the N.A.C.A. reported. Pointing out that the nation is most fortunately situated between two great oceans, the report adds:

"However, as advances in aeronautical science result in increased range of aircraft the significance of these oceans will gradually diminish and superiority in aircraft design will become more and more essential to our national safety."

Most significant event of the year, for the future of American aviation, was the authorization of a second major research laboratory to be established at Moffett Field, California, some 38 miles south of San Francisco.

Further details of what has become known as the "500-mile-an-hour wing" for airplanes was also disclosed in the new report of the N.A.C.A.

Research scientists at the Langley Field, Va., laboratory have discovered "a new principle of wing design in which the transition from smooth (laminar) flow

**DON'T BE SEASICK!**

**Why Bring That Up?**

By Dr. Joseph Franklin Montague

**What to do about Seasickness**

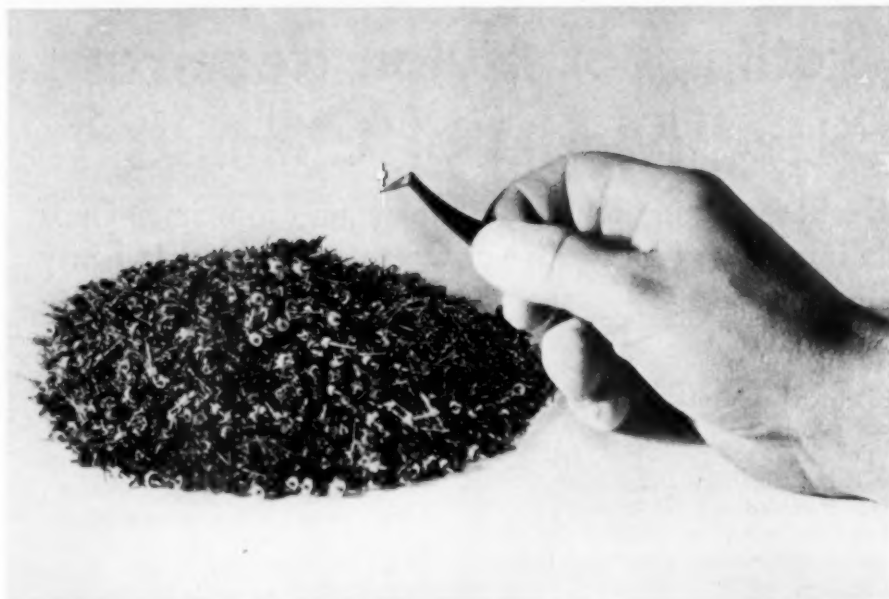
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#### GEOLOGY

## Submarine Canyons May Be Caused by Artesian Springs

### Mudflows and Submarine Landslides Following Cave-Ins Might Account for Unexplained Breaks in Cables

**A** NEW theory to account for the creation of the tremendous submarine canyons that gash the sea bottom off all continental shores of the world is advanced by Prof. Douglas Johnson of Columbia University. These enormous submerged gullies, some of them rivalling the Grand Canyon of Arizona in width and depth, may have been caused by undermining and collapse of the layered rocks of the ocean bottom by long-continued action of submarine artesian springs, Prof. Johnson suggests.

Existence of these submarine canyons is one of the most recent of major geological discoveries. New ones are still being turned up, and further exploration of old ones constantly yields new wonders—and new puzzles for the scientists.

At first, it was thought that the canyons owed their existence to deep erosion during a time when ocean levels were lower than they are now. This

view is still widely accepted. However, serious difficulties have arisen through the discovery of canyons more than two miles below present-day sea level, which of course demands a tremendous amount of change in relatively short geologic time.

Prof. Johnson points out that his theory, of undercutting of the sea bottom by waters working under pressure beneath it, could account for canyons at any depth, and that it has the further advantage of allowing plenty of time. Instead of being confined to the mere million years or so of the Pleistocene ice age, the work of canyon formation could have gone on ever since the Cretaceous period, more than a hundred million years ago, when great saurians still wallowed in the swamps and swam in the seas.

According to the theory, submarine canyons could be formed wherever the layered formation of rocks under the

sea, and a sufficient supply of water under pressure from heights somewhere back inland, combined under favoring circumstances. This could be connected with existing river valleys, as is known to be the case in such places as the famous canyon off the mouth of the Hudson river. However, canyon formation could also take place unassociated with any existing river; and such submarine canyons are known.

Of course, when bottom cave-ins occurred, they would be followed by mudflows, submarine landslides and other adjustments of unconsolidated bottom sediments, which would modify their outlines considerably. Prof. Johnson thinks that such flows and slides account for some of the breaks in trans-oceanic cables that have occurred without any accompanying earthquakes to take the blame.

Prof. Johnson has also invoked a theory of artesian spring action to account for the famous "bays" of the Carolina coastal plain. These are great, shallow, saucer-like elliptical depressions in the land, which another theory holds were created by the impact and explosion of a shower of enormous meteor fragments many thousands of years ago.

*Science News Letter, January 20, 1940*

#### AERONAUTICS

### New Airplane Design Will Increase Safety at Take-off

**B**Y PROPER design the giant four-motored airliners of the future should be able to clear a 50-foot obstacle 3,000 feet from the start of take-off, even if one motor fails, Clarence L. Johnson, chief research engineer, Lockheed Aircraft Corporation, told the meeting of the Society of Automotive Engineers at Detroit.

Take-off time is perhaps the most hazardous period because, during those few brief seconds, engine failure may make a forced landing necessary.

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Increasing the size of the vertical tail surfaces of the new four-motored transport planes would be the most effective way to increase control of the plane needed if one of the four motors failed, Mr. Johnson said.

Some automatic control over the power of the engines, if one of them dies, is needed, the research engineer indicated, for "the pilot should not be expected to juggle throttles, trimming controls, landing gears, flaps and airspeeds during the critical 10 seconds after take-off."

Mr. Johnson described the characteristics of the four-motored plane of the near future which would give it increased safety at take-off. The projected plane could land and take off in smaller landing fields than is now possible.

One striking finding of Mr. Johnson's analysis of take-off safety is that when one of the four motors fails it is best that the power in the corresponding motor on the other side of the plane be reduced to 50% of its rated take-off value. The idea that if one motor failed the other three would need to deliver still greater power is refuted by Mr. Johnson's study.

*Science News Letter, January 20, 1940*

## Improved Spark Plug

**A** NEW and superior type of spark plug for high-powered airplane engines has been developed in England, it was disclosed by A. L. Beall, Wright Aeronautical Corporation.

The new type plug uses ceramic materials for its electrical insulation instead of thin sheets of mica compressed and piled one atop the other. Ceramic spark plugs are not themselves new, but the new British type are outstanding because they can be used under the severe conditions of high-powered aviation motors.

Ceramic spark plugs are smaller and lighter than mica spark plugs, a big advantage for multi-cylindere engines.

*Science News Letter, January 20, 1940*

## CHEMISTRY

# "Father" of Nylon Receives Prized Medal of Chemists

## His Research in Making Big Molecules From Small Ones Is Important Part of Rise of Organic Chemical Industry

**T**HE chemist who initiated the research of making big molecules out of little ones that led to the discovery of nylon, remarkable organic material out of which chemistry can make anything from sheer silk-like stockings to toothbrush bristles and fishline leaders, was awarded one of science's highest honors: the Perkin Medal of the American Section of the Society of Chemical Industry.

The man is Dr. C. M. A. Stine, vice-president in charge of research, of E. I. du Pont de Nemours & Company of Wilmington, Del. In his address following the medal presentation Dr. Stine traced the rise of America's great organic chemical industry of today from its virtual birth at the time of the World War in 1914.

Directly or indirectly from the results of intensive research in organic chemicals have come the following advances: Modern plastics, motion picture film using synthetic camphor, medicinal chemicals like sulfanilamide and sulfapyridine, superior dyes, improved cheap and safe refrigerant fluids like Freon, a vast improvement in the wear of automobile tires, the development of synthetic rubber, safety glass, tougher and more oily oils and lubricants for motor cars, superior gasolines and fuels, better and safer explosives, synthetic urea for fertilizer for agriculture, and the new plant hormones and vitamins.

Contrary to popular belief, American chemical industry was large prior to the World War, but mainly in the inorganic

chemical field, Dr. Stine said. As early as 1865 its products had a valuation of some \$60,000,000. In 1910 the United States produced three times as much sulfuric acid as Germany and twice the amount of alkalies made in England.

In organic chemicals, however, the United States was sadly lacking at the start of the war. The great industry which has been created since that time, in this field, represents an enormous investment of American money and American brains in research, Dr. Stine continued. He revealed that in the case of the du Pont concern alone, \$40,000,000 was invested in research before a cent of profit was realized.

Dr. Stine challenged those who maintain that present national and international ills are the result of too much scientific development.

These people overlook, he said, "the horrible wars that have been waged all down the years when there was no science as we know it today. They overlook or wilfully ignore the well recognized fact that the lust for power by one man, or a small group of men, leads all too frequently to that great social and economic disaster called war. Until indoctrinated race antipathies and hatreds, envy, and greed for power are eliminated from human nature through spiritual regeneration, we shall have no solution of this fatal disease which afflicts humanity. Science, though it is able to confer the richest blessings upon mankind, is not able to change the heart of man and insure that the great increases in scientific knowledge will be beneficially applied. But while this is unquestionably true, I nevertheless hold that the great contribution which the development of the organic chemical industry has made to the self-sufficiency of this country is a definite contribution toward the maintenance of peace."

*Science News Letter, January 20, 1940*

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SCIENCE NEWS

A "howling machine" developed by the Forest Service howls when the exploring coil of the detecting device comes near metal embedded in logs.





### Nature No Nudist

"MOTHER Nature is not a nudist by choice. If left to her own ways, she will clothe herself in a lovely smock of forest trees, or at least in a sarong of weeds or prairie grasses."

So declared Prof. Raymond J. Pool of the University of Nebraska in his address as retiring vice president of the section on the botanical sciences of the American Association for the Advancement of Science.

"I have been intimating that man, for thousands of years, has been running away with her clothes so persistently and so completely that she has had the greatest of difficulty to preserve her modesty. Perhaps the egocentric complex that has for so long time dominated white man in his attitudes toward nature and her primitive ways has finally felt the impact of such shocking demonstrations that we, in America, may pave the way for better times."

The "shocking demonstrations" to which Prof. Pool referred were such disasters as drought, dust storms and mud-laden floods, resulting in part at least from man's boasted "conquest of nature"—which backfired in his face when the climate took a turn for the worse after boom years of prairie-ripping.

Denying any claim that by resodding, reforestation and engineering works man can control all floods, check all dust storms, Prof. Pool nevertheless stated as his belief that such measures, coupled with more intelligent utilization of plowland and rangeland, can do much to reduce such phenomena.

"I would merely insist," he concluded, "that white man should cease to boast of having conquered nature. We should set about the humble task of learning more at her feet."

*Science News Letter, January 20, 1940*

### MEDICINE

## Physicians' Committee Formed For Medical Service Extension

Non-Profit, Non-Political Organization Intended To Educate Public Concerning Preventive Medicine

ORGANIZATION of the National Physicians' Committee for the Extension of Medical Service is announced by the *Journal of the American Medical Association* (Dec. 2), which describes its work as "of the nature of public relations activities."

Objectives of the new organization are said to be covered in the statement that it is "a nonprofit, nonpolitical organization for maintaining ethical and scientific standards and extending medical service to all the people . . . and for . . . cooperating with lay and medical institutions and groups, interested in the preservation of national health, to make more generally known the achievements and to safeguard the independence of American medicine."

The organization, officially launched in Chicago on Nov. 18, the day after the American Medical Association board of trustees held its fall meeting, is headed by an executive board which includes past-presidents and members of the board of trustees of the A.M.A.

"The organization is not, however, officially connected with the American Medical Association itself," states an editorial note in the *A.M.A. Journal*.

"Information elicited from the officials of the National Physicians' Committee," the *Journal* editor continues, "indicates that this group has been organized voluntarily to carry on the education of the public regarding the extension of medical service and preventive medicine. Their work is of the nature of public relations activities."

"The National Physicians' Committee," it is further pointed out, "is in a position to accept contributions from industrial and other organizations in order to aid this campaign. The American Medical Association itself has not in the past and does not now accept such contributions."

Among reasons for forming the new organization, stated by the management committee, are the following:

"If the ethical and scientific standards are to be maintained, the independence

of American medicine preserved and the public interest best served, American physicians must:

"1. Make possible the providing of medical service to the indigent and those in the low income groups, and insure the most widespread distribution of the most effective methods and equipment in medicine and surgery.

"2. Assume the responsibility of countering destructive propaganda by familiarizing the public with the facts in connection with the methods and the achievements of American medicine."

Officers of the new organization are: Dr. Edward H. Cary, Dallas, Texas, chairman; Dr. Austin A. Hayden, Chicago, secretary, and Dr. N. S. Davis III, Chicago, treasurer. Other members of the executive board are: Dr. Irvin Abell, Louisville, Ky.; Dr. F. F. Borzell, Philadelphia; Dr. William F. Braasch, Rochester, Minn.; Dr. John A. Hartwell, New York; Dr. Roger I. Lee, Boston; Dr. Alphonse McMahon, St. Louis; Dr. E. H. Skinner, Kansas City, Mo., and Dr. Charles B. Wright, Minneapolis.

*Science News Letter, January 20, 1940*

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# First Glances at New Books

## Psychology

**MENTAL HEALTH**—Forest Ray Moulton, ed., Paul O. Komora, assoc. ed.—*Science Press*, 470 p., \$3.50 (Publication of the A. A. A. S., No. 9). This symposium on Mental Health was organized in collaboration with the American Psychiatric Association and with the cooperation of the U. S. Public Health Service, the National Committee for Mental Hygiene and the Mental Hospital Survey Committee. It was held at the Christmas meetings of the AAAS in Richmond in 1938-1939, and consisted of 49 papers and 20 invited formal discussions and 21 informal discussions. This symposium is fourth in a series.

*Science News Letter, January 20, 1940*

## Economics

**SPEAKING OF CHANGE: A Selection of Speeches and Articles**—Edward A. Filene—*National Home Library Foundation*, 322 p., paper, 30c., cloth 80c. Business men and psychologists, alike concerned with employment problems, will find common interest in these contributions by Edward A. Filene, posthumously published.

*Science News Letter, January 20, 1940*

## Psychology

**THE PSYCHOLOGY OF COMMON SENSE; A Diagnosis of Modern Philistinism**—A. A. Robak—*Sci-Art*, 350 p., \$3. A readable book and one which will probably evoke discussion among psychologists. In espousing the cause of graphology, for example, the author says that he himself "undoubtedly gives hostages to his reputation."

*Science News Letter, January 20, 1940*

## Paleontology

**TREPOSTOMATOUS BRYOZOA FROM THE TRAVERSE GROUP OF MICHIGAN**—Helen Duncan—*Univ. of Mich. Press*, 98 p., 16 pl., 90c.

*Science News Letter, January 20, 1940*

## Paleontology

**A NEARLY COMPLETE TURTLE SKELETON FROM THE UPPER CRETACEOUS OF MONTANA**—E. C. Case—*Univ. of Mich.*, 19 p., 40c.

*Science News Letter, January 20, 1940*

## Science

**ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION FOR THE YEAR ENDED JUNE 30, 1938**—*Govt. Print. Off.*, 608 p., \$1.50. The story of another year's progress in what is per-

haps the best known of America's research institutions, together with the customary collection of fascinating special articles by scientists in many fields.

*Science News Letter, January 20, 1940*

## Photography

**HOW THEY MAKE A MOTION PICTURE**—Ray Hoadley—*Crowell*, 119 p., \$2. An abundance of photographs and readable text take you behind the scenes of Hollywood's great industry.

*Science News Letter, January 20, 1940*

## Criminology

**HOW CRIMINALS ARE CAUGHT**—Arnold Miles—*Macmillan*, 123 p., 60c. The secretary of the International Association of Chiefs of Police tells the story of the continuous battle of officers of the law against crime.

*Science News Letter, January 20, 1940*

## Archaeology

**EXPLORATIONS IN EASTERN PALESTINE, III**—Nelson Glueck—*Amer. Schools of Oriental Research*, 288 p., 68 figures, 22 plates, \$2.50. (Annual, Vols. XVIII-XIX for 1937-1939.) The place of Transjordan in ancient Near Eastern affairs is being traced by extensive archaeological surveys. In this report, Dr. Glueck discusses latest evidence for clarifying political, economic, religious, and other developments.

*Science News Letter, January 20, 1940*

## Journalism—Photography

**PICTORIAL JOURNALISM**—Laura Vitray, John Mills, Jr. and Roscoe Ellard; Art work by Samuel F. Perkins—*McGraw-Hill*, 437 p., \$4. Intended as a college text for the journalism student, this book should also prove interesting reading for advertisers, photographers, and all others concerned with the "eye-appeal" of newspapers and magazines.

*Science News Letter, January 20, 1940*

## Mining

**SEVENTEENTH ANNUAL REPORT OF THE SAFETY IN MINES RESEARCH BOARD, Including a Report of Matters Dealt with by the Health Advisory Committee, 1938**—Great Britain, Mines Department—*British Library of Information*, 123 p., 60c.

*Science News Letter, January 20, 1940*

## Child Study

**JUVENILE DELINQUENCY IN MASSACHUSETTS AS A PUBLIC RESPONSIBILITY**—*Massachusetts Child Council*, 196 p., 50c.

*Science News Letter, January 20, 1940*

## Paleontology

**OBSERVATIONS ON FOSSIL PLANTS FROM THE DEVONIAN OF EASTERN NORTH AMERICA. IV. Plant Remains from the Catskill Delta Deposits of Northern Pennsylvania and Southern New York**—Chester A. Arnold—*Univ. of Mich. Press*, 42 p., 10 pl., 60c.

*Science News Letter, January 20, 1940*

## Psychology

**LOVE PROBLEMS OF ADOLESCENCE**—Oliver M. Butterfield—*Emerson*, 212 p., \$2.25. See page 40.

*Science News Letter, January 20, 1940*

## Photography

**FLASH! SEEING THE UNSEEN BY ULTRA HIGH-SPEED PHOTOGRAPHY**—Harold E. Edgerton and James R. Killian, Jr.—*Hale, Cushman & Flint*, 203 p., \$3. The extraordinary photographs taken by Dr. Edgerton in his laboratories at Massachusetts Institute of Technology are here made available with interesting and detailed explanations of how they were taken and what they mean. An attractive picture book, it is nevertheless more than that because with details, method and bibliography, it becomes an important factual publication in the literature of photography.

*Science News Letter, January 20, 1940*

## Entomology

**BIONOMICS OF ENTOMOPHAGOUS INSECTS, Vol. II**—W. V. Balduf—*John S. Swift Co.*, 388 p., \$7.50. A technical summary of the world literature on the life of moths, butterflies, caddis flies, scorpion flies and lacewing flies that prey on other insects.

*Science News Letter, January 20, 1940*

## Physics

**THE NATURE OF THE ATOM**—G. K. T. Conn—*Chemical Pub. Co.*, 115 p., \$1.50.

**THE WAVE NATURE OF THE ELECTRON**—G. K. T. Conn—*Chemical Pub. Co.*, 78 p., \$1.50.

**THE NATURE OF CRYSTALS**—A. G. Ward—*Chemical Pub. Co.*, 114 p., \$1.50.

These three little books are planned to satisfy any intelligent layman's curiosity about the developments of modern physics. Each book assumes little on the part of the reader but begins at the beginning and, by easy stages, works up to the boundaries of present knowledge. Mathematics are virtually missing and if you can comprehend the algebraic meaning of a plus b and ab your mathematical troubles are over.

*Science News Letter, January 20, 1940*

*Science News Letter*